REMARKS

These remarks follow the order of the paragraphs of the office action. Relevant portions of the office action are shown indented and italicized.

DETAILED ACTION

1. Claims 1-23 remain pending in this examination. claims 15-17, and 21 remain withdrawn as being drawn to a nonelected invention.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-6, 8-14, 18-20,22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goyal et al. (USPN 6,976,258) (hereinafter Goyal) in view of Vaid et al. (USPN 6,137,777) (hereinafter '777).

In response, the applicants respectfully state that they take continued exception with the equivalencies of the elements of the claims and the invention of Goyal with or without Vaid. Claims 1-6, 8-l4, 18-20, 22 and 23 as amended are not anticipated by the invention of Goyal with or without Vaid. The abstract of the present invention, claimed in Claims 1-5, 8-l4, 18-20, 22 and 23 reads:

> The increasing number of Internet users and innovative new services such as e-commerce are placing new demands on Web servers. It is becoming essential for Web servers to provide performance isolation, have fast recovery times, and provide continuous service during overload at least to preferred customers. The invention describes a kernel-based architecture for content-aware service differentiation that protects Web servers against overload by controlling the amount and rate of work entering the system. We have invented a mechanism that provides admission control and service differentiation based on connection and application level information. The *application header-based connection*

control uses application-level information (such as URIs and cookies for HTTP) to define different service differentiation actions. The present invention provides the kernel mechanisms that are more efficient and scalable than application level controls implemented in current Web servers.

The present invention claims a kernel-based architecture for content-aware service differentiation that protects Web servers against overload by controlling the amount and rate of work entering the system. The claimed mechanism provides admission control and service differentiation based on connection and application level information.

Whereas, the cited art to Goyal , US Patent 6,976,258, filed: November 30, 1999, is entitled: "Providing quality of service guarantees to virtual hosts". The Goyal abstract reads :

> "A method facilitates providing appropriate quality of service guarantees to a plurality of virtual hosts on a single physical host computer. A server application program and its child processes service communication requests made to the plurality of virtual hosts. Quality of service parameters associated with the virtual hosts are stored. Communication requests made to a specific one of the virtual hosts are detected. The quality of service parameters associated with the specific virtual host are obtained. Operating system resources are utilized to guarantee, to a child process of the server application program, a quality of service according to the obtained quality of service parameters associated with the virtual host. Communication between the virtual host and the client is allowed to proceed, the communication being managed by the child process.".

Goyal is concerned only with efficiently routing connections to one of multiple virtual hosts on a single physical system by intercepting system calls. Goyal is apparently not concerned with content-aware service differentiation that protects Web servers against overload by controlling the amount and rate of work entering the system that provides admission control and service differentiation based on connection and application level information.

The other cited art to Vaid , US Patent 6,341,309, filed: December 24, 1997, is entitled: "Firewall system for quality of service management". The Vaid abstract reads:

> "A novel system for a network of computers to improve quality of services using a combination of a bandwidth management tool in a firewall. The present system includes, among other elements, a plurality of computers, which are each coupled to each other to form an internal network of computers (e.g., local area network or LAN). The system also includes a server, which has a memory sufficient to store a firewall program. The server is coupled to at least one of the plurality of computers, where the server is also coupled to an outgoing line to a wide area network of computers, which can be, for example, the Intenet. A bandwidth management tool is coupled to or stored in the server, where the bandwidth management tool is capable of monitoring incoming and outgoing information to and from the server.".

Thus Vaid is concerned with a system for a network of computers to improve quality of services using a combination of a bandwidth management tool in a firewall. Besides, there is apparently no reason to combine Goyal and Vaid except to attempt to allegedly find a combination that employs the elements of the present claims using hindsight. This is not allowed especially when neither reference cites the other. But even when combined the references do not make the present claims obvious.

Goyal with or without Vaid is not concerned with using application information or application header information for service differentiation as in the present claims, and are apparently not concerned with content-aware service differentiation that protects Web servers against overload by controlling the amount and rate of work entering the system providing admission control and service differentiation based on connection and application level information. The references apparently rely on network addresses which are well defined in the TCP communication protocol, not application headers as in the present claims.

Applicants respectfully further state that the presently claimed invention includes a mechanism that provides admission control and service differentiation based on connection and application

level information. This mechanism can be used by 1) a system that is not virtualized (e.g. a physical system) 2) inside a single virtual host 3) across multiple virtual hosts which are virtualized by the underlying system 4) a physical system with more than one application. This is not the case with any of the cited references. Thus Claims 1-5, 8-l4, 18-20, 22 and 23 are allowable over the cited art combination.

3. Referring to claim 1, Goyal discloses a method comprising employing at least one system for differentiating at least one service class in a kernel (i.e. operating system) by providing service differentiation as a kernel service (i.e. the Office construes the term kernel service as a system which can call the kernel to provide a service on behalf of another entity) and using service differentiation (i.e. QoS) to perform service differentiation based on content in at least one data packet for connections accepted in said at least one system (i.e. connections are accepted pending QoS requirement fulfillment). including the steps of: capturing at least one data packet until a complete application header is detected ("all such requests are received by the server application program") (i.e. an inherent feature of receiving a request is that the packet has an application header) (col. 6, lines 45-50); parsing said complete application header to determine at least one application tag (i.e. attribute information such as source and destination address 201 which are contained in the application header) (col. 9, lines 28-38); matching said at least one application tag to at least one matching rule (i.e. where the communication channel is to one of the network addresses) col. 9, Lines 30-38); and determining a presence of at least one match with said at least one matching rule (i.e. where the communication channel is to one of the network addresses) (col. 9, lines 30-38); and performing service differentiation (i.e. setting the quality of service guarantees, the object code calls the operating system QoS manager 127 to request an appropriate QoS guarantee to the child process 109) (col. 9, lines 38-55).

Goyal does not explicitly state that the system utilizes application tags from an application protocol. In analogous art, 777 discloses another QoS system which differentiates services based on application Layer tags (i.e. traffic classes or traffic types, such as service type such as HTTP, FTP, etc., and URL of the source and destination and file types as well which all can be construed as application tags) (col. 11, line 67; col. 12, lines 55-67). '777 further discloses the use of traffic policies being applied to traffic classes to create action rules to control the traffic behavior on specific classes (col. 13, lines 10-55; col. 15, lines 5-37; col. 16, lines 28-58), and adding and deleting rules based on a user's request (col. 13, lines 47-55). It would have been obvious to one of ordinary skill in the art to combine the teaching of '777 with Goyal in order to improve the use of bandwidth management in a wide area network by applying various techniques for rate controlling bases on various attributes of a connection.

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 1 and the invention of Goyal with or without Vaid.

The office communication states:

> *(i.e. an inherent feature of receiving a request is that the packet has an application header) (col. 6, lines 45-50);*

Applicants respond that this does not imply that Goyal operates on application information. Goyal is operating on network protocol information.

The office communication states:

> *(i.e. attribute information such as source and destination address 201 which are contained in the application header) (col. 9, lines 28-38);*

Applicants respond that this points out a core of the office communication's misunderstanding. Source and destination address in Goyal 201 are referring to the source and destination **network** address in the network protocol header (e.g. TCP/IP), not the **application header**.

The office communication states:

> *(i.e. where the communication channel is to one of the network addresses) (col. 9, lines 30-38);*

Applicants respond that Goyal is operating on the network protocol information (e.g. Network addresses). Goyal is not operating on application header information. An example of a network address is a TCP/IP address which is part of the network protocol layer, it is not part of the application layer information.

The office communication states:

> *(i.e. where the communication channel is to one of the network addresses) col. 9, Lines 30- 38);*

Applicants respond that again Goyal is using network protocol information not application tag information.

The office communication states:

> and performing service differentiation (i.e. setting the quality of service guarantees, the object code calls the operating system QoS manager 127 to request an appropriate QoS guarantee to the child process 109) (col. 9, lines 38-55).

Applicants respond that again, Goyal is operating on network protocol information.

The office communication states:

> *Goyal does not explicitly state that the system utilizes application tags from an application protocol. In analogous art, 777 discloses another QoS system which differentiates services based on application Layer tags (i.e. traffic classes or traffic types, such as service type such as HTTP, FTP, etc., and URL of the source and destination and file types as well which all can be construed as application tags) (col. 11, line 67; col. 12, lines 55-67). '777 further discloses the use of traffic policies being applied to traffic classes to create action rules to control the traffic behavior on specific classes (col. 13, lines 10-55; col. 15, lines 5-37; col. 16, lines 28-58), and adding and deleting rules based on a user's request (col. 13, lines 47-55). It would have been obvious to one of ordinary skill in the art to combine the teaching of '777 with Goyal in order to improve the use of bandwidth management in a wide area network by applying various techniques for rate controlling bases on various attributes of a connection.*

Applicants respond that the QoS referred to in Vaid, 777, is referring to bandwidth management, not to service differentiation for applications. Vaid, 777, is not providing different classes of service for incoming application requests, as claimed in claim 1. If it was so obvious Goyal would have made claims on this 2 years later. This is apparently hindsight in an attempt to find a combination for elements of the claims, which are not even taught in the combination.

A review of Goyal (col 9, lines 28-38) shows that Goyal is not parsing application headers, Goyal is doing standard TCP receive processing on the communication protocol header.

Goyal col 6, lines 45-50 does not cover "capture" a complete application header. Simply receiving a request by the server application as stated in Goyal does not detect and capture the application header. An awareness of the application header format is required as we have

described using HTTP as the example. Goyal is simply receiving data NOT capturing/detecting a complete application header.

Goyal (col 9, lines 30-38) is not matching said at least one application tag to a matching rule, Goyal is using standard TCP receive processing on a network communication protocol header to find a desire network address defined in a communication protocol.

Goyal has not disclosed the operating system resources required to provide service differentiation (i.e. QoS). Goyal has not disclosed the content they differentiate service on, only an identification of the connection via an IP address. Goyal has not disclosed providing service differentiation based on application headers or tags. Source and destination addresses mentioned by Goyal are not included in the application header they are contained in the network transport layer. Thus claim 1 and all claims that depend on claim 1 are allowable over Goyal.

Even with Vaid the elements of claim 1 are not alluded to. Vaid col. 2, lines 33-35 reads:

> Telecommunication techniques have been around for numerous years. In the early days, people such as the American Indians communicated to each other over long distances using "smoke signals." Smoke signals were generally used to transfer visual information from one geographical location to be observed at another geographical location. Since smoke signals could only be seen over a limited range of geographical distances, they were soon replaced by a communication technique known as telegraph. Telegraph generally transferred information from one geographical location to another geographical location using electrical signals in the form of "dots" and "dashes" over transmission lines. An example of commonly used electrical signals is Morse code. Telegraph has been, for the most part, replaced by telephone. The telephone was invented by Alexander Graham Bell in the 1800s to transmit and send voice information using electrical analog signals over a telephone line, or more commonly a single twisted pair copper line. Most industrialized countries today rely heavily upon telephone to facilitate communication between businesses and people, in general.

Vaid col. 5, lines 20-60 reads:

> 1. Traffic Classes
>
> An embodiment of the present invention discriminates between traffic classes or traffic types. For example, between application/protocol (e.g., HTTP, SMTP, FTP, Telnet), data-type (e.g., MIME type, HTML, JPEG, RealAudio, .WAV, .MOV), source/destination identifier (e.g., IP address, user name, domain, URQ), type (real-time,

interactive, throughput-intense), direction (inbound/outbound), and the like. Further traffic classes are based upon specifics user (e.g., President, Shipping Clerk), business group (e.g., Sales, Engineering, Accounting), priority (e.g., user-determined priority levels), direction (e.g., inbound, outbound, customer, guest).

FIG. 3 illustrates an example of a hierarchical model for determining bandwidth sharing. This model is merely an illustration and should not limit the scope of the claims herein. As illustrated in FIG. 3, a hierarchical model is represented as a tree, with the root representing the total available bandwidth, each branch node representing aggregated traffic (meta-traffic classes), and the leaves representing individual connections (traffic classes). This model gives the user flexibility in defining and implementing a service policy or multiple service policies. For example, the network traffic is first divided in different ways and then the specific policy refined from a top down approach or amalgamated from a bottom up approach. This model also provides the user with different methods for different traffic classes since it abstracts the policy definition from the enforcement or implementation.

The user typically has competing factors to consider when determining a network QoS policy, including bandwidth "guarantees", latency "guarantees", and exception control. It should be understood "guarantees" refer to best efforts of the system to provide service, and does not in any way imply an absolute guarantee of service. For example, obviously no service can be provided or guaranteed if the network connection is inoperative, if the Internet Service Provider (ISP) has hardware or software glitches, or there is a general Internet crash.

A first factor is bandwidth guarantee, or data throughput guarantee, and how excess bandwidth is shared. For traffic classes that have data intensive requirements this is an important criteria. Typically, the user initially determines what are the minimum bandwidth guarantees that are given for different traffic classes or for connections relying on data from the different traffic classes, before determining a policy. As result of the policy, the system monitors the actual bandwidth provided to different classes, and preferably if bandwidth is critically low, the system attempts to provide at least the minimum bandwidth to the different traffic classes.

A review shows that Vaid doesn't disclose a QoS system as in claim 1. Vaid may disclose which. traffic classes or traffic types, such as application protocol such as HTTP, FTP, etc.) (col. 5, lines 20-60). This is not differentiation of services based on application layer tags of claim 1. One of ordinary skill in the art could not combine the teaching Vaid with Goyal in order to provide the method of claim 1. Claim 1 is not limited to improve the use of bandwidth management in a wide area network by applying various techniques for rate controlling bases on various attributes of a connection as supported by Vaid (col. 2, lines 33-35; col. 5. lines 20-60).

Furthermore the combined art does not allude to "employing differentiating a service class in a kernel providing service differentiation as a kernel service based on application level information." The combined art does not allude to "using service differentiation to provide different levels of quality of service for system performance to users to perform service differentiation based on content in at least one data packet for connections accepted in said at least one system" The combined art does not allude to "providing content aware application header-based service differentiation in a Web server which communicates with clients over a network protecting the Web server against overload by controlling the amount and rate of work entering the system." The combined art does not allude to "capturing said at least one data packet until a complete application header is detected ." The combined art does not allude to "parsing said complete application header to determine at least one application tag within the kernel which include classification and action rules ." The combined art does not allude to "matching said at least one application tag to at least one matching rule ." The combined art does not allude to "determining a presence of at least one application tag match with said at least one matching rule ." The combined art does not allude to "performing service differentiation action based on said at least one matching rule in order to provide a particular level of service from said different levels of service ." The combined art certainly does not allude to "deleting and adding rules based upon a user request. Thus claim 1 and all claims that depend on it are allowable over the cited combined art.

4. Referring to claim 2, '777 discloses the application tag includes a tag in an application protocol (i.e. a URL is a tag in HTTP) (col. 12, lines 55-65).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 2, and the invention of Goyal with or without Vaid. One may find patents that refer to, or allude to, an application tag, but one cannot find a single one that uses an application tag for service differentiation as stated in claim 1, upon which claim 2 depends.

A review of Vaid shows that Vaid fails to disclose a method that differentiates services based on application layer tags. Vaid's. traffic classes or traffic types, such as application protocol such as HTTP, FTP, etc. (col. 5, lines 20-60) are not an application layer tag as in claim 2. Goyal is referring to network addresses from the TCP transport layer (col 1, lines 35-45) which is not application layer information. Thus claim 2 is allowable over the cited art for itself and because it depends on an allowable claim.

5. Referring to claim 3, it is an inherent feature in HTTP that the URI (i.e. destination address) is the second string in the HTTP header, (the first string is the action word, such as GET POST HEAD SYN, etc.)..

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 3 and the invention of Goyal with or without Vaid.

The office communication states:

> it is an inherent feature in HTTP that the URI (i.e. destination address) is the second string in the HTTP header, (the first string is the action word, such as GET POST HEAD SYN, etc.)

Applicants respond that in claim 3, applicants are using claim differentiation to be really precise in what the invention is referring to so, so that for example, a network address could not be construed as an application tag. Applicants respectfully take exception with the equivalencies of claim 3 and the application of inherentcy to Goyal and Vaid. Goyal is referring to intercepting system calls that operate on the transport layer network address which is part of the communication protocol not application headers like HTTP. Thus claim 3 is allowable over the cited art for itself and because it depends on an allowable claim.

6. Referring to claim 4, Goyal discloses employing a table having at least one matching rule (i.e. QoS parameter table 119) (Figure 1; col. 7, lines 60-65).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 4 and the invention of Goyal with or without Vaid.

The office communication states:

> Goyal discloses employing a table having at least one matching rule (i.e. QoS parameter table 119) (Figure 1; col. 7, lines 60-65)

Applicants respond that Goyal does not have a table with application level contained it. A table is indeed a very common construct in the field of computing. The contents and purpose of use are what differentiate one table from another. The art fails to teach the table of claim 4.

Goyal col. 7, lines 60-65 reads:

> In the embodiment of the present invention depicted in FIG. 2, a virtual host quality of service application program 117 executes in the computer memory 103. The quality of service program 117 inserts a quality of service parameter table 119 into the operating system 105 of the host computer 101. The quality of service table 119 contains quality of service parameters for each network address 201 associated with one of the virtual hosts 115 serviced by the virtual host server 107. The quality of service program 117 utilizes techniques known in the art to insert the table 119 into the operating system 105. In a preferred embodiment, the present invention dynamically links a module to an operating system kernel, while the kernel is active. The module is preferably in the form of object code comprising an empty quality of service table 119, and subroutines to add, modify, and delete quality of service parameters for different virtual hosts. The quality of service application program 117 then calls the appropriate subroutine to add the quality of service parameters for the virtual hosts 115 serviced by the server program 107. The quality of service program 117 utilizes the subroutines to add, modify, and delete quality of service parameters as desired. In alternative embodiments, the module contains additional subroutines, or only a subset of the subroutines listed above. In one alternative embodiment, the table 119 is first filled with quality of service parameters and then linked to kernel as a module. In an alternative embodiment, the quality of service table 119 is stored outside of the operating system 105 in computer memory 103.

A review of this section shows that indeed Goyal does not allude to "employing a table having said at least one matching rule based on application layer information," as in claim 4. A review of the other cited portion of Goyal (col. 7, line 63) employs a table which can be matched on network address from the TCP transport layer but that is not matched based on application layer information. Claim 4 is based on application layer information. Thus claim 4 is allowable over the cited art for itself and because it depends on an allowable claim.

7. Referring to claim 5, Goyal discloses finding a best match (i.e. finding the network address requested) (col. 9, lines 30-45).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 5, and the invention of Goyal with or without Vaid.

The office communication states:

> Goyal discloses finding a best match (i.e. finding the network address requested) (col. 9, lines 30-45)

Applicants respond that claim 5 matching is a common technique in the computer field but the contents and purpose of the match are what differentiate a match. Claim 5 is matching application tag information in order to provide different levels of service to users of applications.

Goyal only finds a best match on network address but not any other type of content like application layer information. Claim 5 is content for application layer information. Thus claim 5 is allowable over the cited art for itself and because it depends on an allowable claim.

> *8. Referring to claim 6, Goyal discloses service differentiation includes rate controlling (i.e. guaranteeing a quality of service) (col. 9, lines 38-55).*

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 6 and the invention of Goyal with or without Vaid.

The office communication states:

> Goyal discloses service differentiation includes rate controlling (i.e. guaranteeing a quality of service) (col. 9, lines 38-55)

Applicants respond that Goyal does not make references on the specific actions on rate controlling scheduling connections, monitoring, request prioritization, and a policing action based on application layer information. In fact application layer awareness maybe required to perform an intelligent action for a given application. In other words, without application awareness some actions might be meaningless. For example, if one wants to provide better service for buy versus browse customers using a web server, application layer information is required.

Goyal, apparently does not disclose the any of the claimed mechanisms for service differentiation and further does not disclose any of the mechanisms disclosed in claim 6. Claim 6 reads:

> 6. A method as in claim 1, wherein said step of performing service differentiation action includes at least one action taken from a group of actions including: scheduling connections, monitoring, request prioritization, and a policing action.

Thus claim 6 is allowable over the cited art for itself and because it depends on allowable claim 1.

> *9. Referring to claim 8, Goyal discloses said action includes protocol control (i.e. QoS rate guaranteeing) (col. 9, lines 30-35).*

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 1 and the invention of Goyal with or without Vaid.

The office communication states:

> Goyal discloses said action includes protocol control (i.e. QoS rate guaranteeing) (col. 9, lines 30-35)

Goyal is not performing the following actions based on application layer information, sending a reset message, sending an application return code, determining compliance with a given rate and/or burst, prioritization, weighted round robin, round robin, ordering, recording statistics, performing a cleanup, and protocol control. Goyal does not perform an **application** protocol (e.g. HTTP) action.

Exception with the equivalencies or teaching of claim 8 and the alleged action including protocol control (i.e. QoS rate guaranteeing) (col. 9, lines 30-35) to Goyal. The protocol of claim 8 is not found in the referenced portion of Goyal (col 9. lines 30-35). Goyal does not disclose any of the mechanisms for service differentiation and further does not disclose any of the mechanisms disclosed in claim 8. Thus claim 8 is allowable over the cited art for itself and because it ultimately depends on allowable claim 1.

10. Referring to claim 9, Goyal discloses installing at least one matching rule (i.e. the Virtual Host QoS program 117 inserts the QoS Table 119 into the OS to be used by the QoS manager 127) (col. 7, lines 60-65).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 1 and the invention of Goyal with or without Vaid.

The office communication states:

Goyal discloses installing at least one matching rule (i.e. the Virtual Host QoS program 117 inserts the QoS Table 119 into the OS to be used by the QoS manager 127) (col. 7, lines 60-65)

In response, claim 9 is a method as in claim 1, further comprising installing at least one matching rule to provide a higher level of system performance for higher classed packets and connections based on **application layer information.** Goyal does not disclose installing at least one matching rule based on **application layer information**.

Applicants respectfully take exception with the equivalencies and teaching of claim 9 and the alleged installing at least one matching rule (i.e. the Virtual Host QoS program 117inserts the QoS Table 119 into the OS to be used by the QoS manager 127) (col. 7, lines 60-65) to Goyal. Goyal only installs matching rules on network addresses not any other content like application information. A review of the cited portion of Goyal (col. 7, *lines 60-65*) employs a table which can be matched on network address from the TCP transport layer but that are not matched based on application layer information. Claim 9 is amended to show that it is based on application layer information. Thus claim 9 is allowable over the cited art for itself and because it depends on allowable claim 1.

11. Referring to claims 10 and 11, Goyal discloses detecting establishment of a new TCP connection (i.e. request for Address) (col. 1, lines 15-20; col. 6, lines 45-50).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 1 and the invention of Goyal with or without Vaid.

The office communication states:

> *Goyal discloses detecting establishment of a new TCP connection (i.e. request for Address) (col. 1, lines 15-20; col. 6, lines 45-50)*

A review shows that Goyal does not disclose detecting establishment of a new connection for the purpose of service differentiation based on application layer information and providing admission control and service differentiation based on connection and application level information as in claim 10. The address Goyal refers to is the network address which is part of the network protocol and not the application protocol.

In response, the applicants respectfully states that they exception with the equivalencies of claims 10 and 11, and the alleged disclosed detecting establishment of a new TCP connection (i.e. request for Address) (col. 1, lines 15-20; col. 6, lines 45-50) to Goyal.

Goyal col. 1, lines 15-20 reads:

> With the popularity and success of the Internet, server technologies are of great commercial importance today. Typically, a server program executing on a single physical host computer services client requests made to a single network address allocated to the host. However, using Transmission Control Protocol (TCP) and other transport protocols, a server application executing on a single physical host can be programmed to process requests made to multiple network addresses. Such functionality is known as virtual hosting.

Goyal col. 6, lines 45-50 reads:

> Client computers 111 send requests 113 to a plurality of virtual hosts 115 which are supported by the server 107. All such requests are received by the server application program 107 and are processed by the child processes 109. For purposes of example, FIG. 1 illustrates three client computers 111 (client computer 111A, client computer 111B, and client computer 111C), each making separate requests 113 to a separate virtual host 115. It is to be understood that more or fewer client computers 111 can make more or fewer

requests 113 to more or fewer virtual hosts 115. It is to be understood that the clients 111 are typically remote from the server 107 and physical host computer 101.

A review of the cited portions shows that Goyal does disclose detecting establishment of a new TCP connection but for the purpose of routing connections to one of multiple virtual hosts on a single physical system by intercepting system calls not to provide admission control and service differentiation based on connection and application level information.

Besides, claim 10 was amended to include "and providing admission control and service differentiation based on connection and application level information." Thus claims 10 and 11 are allowable over Goyal each for itself and because each depends on an allowable claim.

12. Referring to claim 12, Goyal discloses the step of establishing a new TCP connection includes receiving a SYN packet, sending a SYN-ACK packet, deferring accept, receiving ACK for SYN-ACK and deferring notification of data packet (this is an inherent feature of the HTTP basic 3-way handshake for Connection synchronization which can be found in the Transmission Control Protocol DARPA Internet program protocol Specification September 1981 prepared by Information Sciences Institute, USC, page. 31 Figure 7) (col. 6, lines 45-50).

In response, the applicants respectfully states that they take continued exception with the office communication equivalencies, and/or teachings of the elements of the claim 1 and the invention of Goyal with or without Vaid.

The office communication states:

Goyal discloses the step of establishing a new TCP connection includes receiving a SYN packet, sending a SYN-ACK packet, deferring accept, receiving ACK for SYN-ACK and deferring notification of data packet (this is an inherent feature of the HTTP basic 3-way handshake for Connection synchronization which can be found in the Transmission Control Protocol DARPA Internet program protocol Specification September 1981 prepared by Information Sciences Institute, USC, page. 31 Figure 7) (col. 6, lines 45-50)

In response, applicants respectfully take exception with the teachings of claim 12 and the alleged HTTP inherentcy and the art to Goyal. Claim 12 reads:

12. A method as in claim 11, wherein said step of establishing of a new TCP connection includes for application header based service differentiation: receiving SYN packet; sending SYN-ACK packet; deferring accept; receiving ACK for SYN-ACK packet; and deferring notification of data packet.

Goyal (col. 1, line 34) may indeed indicate that the 3-way handshake is an inherent feature of TCP. But Goyal does not disclose using the 3-way handshake for application header based service differentiation. Thus claim 12 is allowable over the cited art for itself and because it ultimately depends on allowable claim 1.

13. Referring to claim 13, detecting application header delimiters for said data packet is an inherent feature of Goyal since without this detection step, the system would not know where the header starts and ends.

In response, the applicants respectfully states that they exception with the equivalencies of claim 13 and the alleged HTTP inherentcy and the art to Goyal. Goyal is not referring to application headers like HTTP in their disclosure, they are referring to transport or network layer headers which are defined as clear offsets in the TCP/IP protocol. So Goyal does not have to detect application layer delimiters. Goyal makes no reference about application header delimiters so Goyal does not need to detect them. Goyal makes claims on the network protocol headers. Thus claim 13 is allowable over the cited art for itself and because it depends on allowable claim 1.

14. Claims 14, and 18-20, 22, and 23 are rejected for similar reasons as stated above.

In response, the applicants respectfully states that they exception with the equivalencies of Claims 14, and 18-20, 22, and 23 and the art to Goyal and/or Taylor. It is unfortunate that the office communication does not even attempt to show the art citations regarding Claims 14, and 18-20, 22, and 23

In response, the applicants respectfully states that claim 14 is not taught by the combination.

A review of Goyal shows that Goyal does not disclose providing service differentiation by parsing application layer information (e.g. HTTP headers). They are only concerned with network addresses and Goyal don't disclose any mechanism for an operating system resource for quality of service or service differentiation.

Goyal does not do providing content aware application header-based service differentiation in a server which communicates with clients over a network protecting the server against overload by controlling the amount and rate of work entering the system.

Goyal does not have the provider of admission control and service differentiation based on connection and application level information.

Goyal does not have the parser since Goyal is not parsing an application tag.

Goyal does not have the selector since Goyal does not have a parsed application tag to select on.

Goyal does not have the performer since Goyal makes requests for service differentiation to be performed by the operating system quality of service manager, and does define the actions of the quality of service manager as for claim 14.

Furthermore, Goyal doesn't provide service differentiation as a kernel service based on application level information of Claims 14, and 18-20,22, and 23. Thus Claims 14 is allowable, and claims 18-20,22, and 23 are allowable over the cited art each for itself and because its dependence on an allowable claim.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goyal in view of '777 in view of Taylor et al. (USPN 6,728,885) (hereinafter Taylor) (cited in previous Office Actions).

The cited art to Taylor, US Patent 6,728,885, filed: October 8, 1999, is entitled: "System and method for network access control using adaptive proxies ". The Taylor abstract reads:

"A method, system and computer program for providing multilevel security to a computer network. The method comprises the step of receiving a first communication packet on at least one network interface port from an outside network. The method further includes the steps of filtering the first packet in one of at least two levels of security comprising a first level of security which examines the content information of the packet and a second level of security which examines the first packet excluding the content information of the packet. The system includes a first packet filter configured to filter its input packets by examining content information of its packets and a second packet filter configured to filter its input packets by examining the header information without examining the content information of its packets. The system further includes a third filter which is configured to forward a number of packets to one of the first and second filters, thereby providing security to the computer network. The computer program includes a first module located in an application layer, a second module located in a network layer, and a third module located in a kernel space and configured to examine a number of packets received by the computer network from at least one outside network and to forward the number of packets to one of the first and second modules after examining the number of packets".

Thus Taylor is concerned with network access control using adaptive proxies. Taylor is not concerned with service differentiation as in Claims 14, and 18-20, 22, and 23.

15. Goyal discloses the invention substantively as described in claim 1. Goyal does not specifically disclose the step of performing service differentiation includes dropping based on rules that are created to provide better performance to the connections that are accepted. In analogous art, Taylor discloses another service differentiation system which includes dropping a connection based on rules that are created to provide better performance to the connections that are accepted (i.e. all firewall rules inherently provide better performance to those connections that are accepted since firewall rules block incoming traffic which will congest the network and thwart attackers from disabling the network) (col. 6, lines 25-30). It would have been obvious to one of ordinary skill in the art to combine the teaching of Taylor with Goyal and 777 in order to achieve requested levels of security while meeting performance constraints as supported by Taylor (col. 3, lines 20-25).

In response, the applicants respectfully state that they take exception with the equivalencies of the elements of claim 7 and the inventions of Goyal with Taylor. Claim 7 is not made obvious by the

combination of the inventions of Goyal and Taylor. Taylor is concerned with system security. Taylor is not concerned with system performance as in the Claim 7.

Taylor is dropping connections in a firewall for system security. All firewall rules do not inherently provide better performance. The rule might be blocking connections that only establish connections that don't use further system resources but the rule might miss the one connection which makes requests that uses 100% of the system resources. No one disclosure has been made that enables service differentiation based on application layer information.

Furthermore there is not reason to make the combination of Goyal and Taylor, except using hindsight in an attempt to reconstruct the elements of claim 7. A combination of art may not be made if not referred to in one of the cited references. Thus claim 7 is allowable over the cited art.

Applicants respectfully take exception with the equivalencies of the claimed invention and the application of inherentcy to Goyal and Taylor The cited portion to Taylor, col. 3, lines 20-25 reads:

> Such specification of resource allocation is called a guarantee of quality of service.
>
> A server, which is a process, executing on a dedicated physical host services client requests for a single network address (physical host) only. Thus, quality of service can simply be set for the server to the quality of service appropriate for the host. A virtual host server services numerous client requests for multiple virtual hosts. A single virtual host server provides host services for a plurality of customers all of whom may require different quality of service. Although it would be possible to set a single quality of service for the virtual host server, no single quality of service is appropriate for all of the virtual hosts.

The other cited portion to Taylor, col. 6, lines 25-30 reads:

> DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS
>
> System Overview
>
> FIG. 1 presents a high level overview of a system for setting quality of service guarantees for virtual hosts in accordance with a preferred embodiment of the present invention. A single, physical host computer 101 contains computer memory 103, conventional processor(s), networking interfaces, and input/output devices (not shown). An operating

> system 105, a virtual host server application program 107, and a plurality of child processes 109 of the server application program 107 reside in the computer memory 103. For purposes of example, FIG. 1 illustrates three child processes 109 of the virtual host server application program 107: a first child process 109A, a second child process 109B, and a third child process 109C. It is to be understood that more or fewer child processes 109 can reside in the computer memory 103 as desired.

A review of these portions apparently shows that Taylor [and Goyal] do not disclose or make obvious any actions from an operating system resource that provide quality of service or service differentiation for an application. Goyal relies on resources provided by the operating system to provide quality of service or service differentiation and does not specify any actions as stated in claim 6 or claim 7. Taylor discloses a single action dropping for purpose of security via a firewall with no mention of performance gain. Dropping has an indirect benefit of performance improvement only if the administrator properly sets the dropping rule for performance and not just security. There is no indication in the referenced art of an administrator setting performance based rules. Thus claim 7 is allowable over the cited art for itself and because it depends on allowable claim 1.

Response to Arguments

> *16. Applicants arguments filed October 10, 2005 have been fully considered but they are moot in view of the new grounds of rejection.*

In response, the applicants respectfully states that the office communication fails to respond to the many particular remarks made previously, particularly in regard to dependent claims which are rejected to Goyal alone. This is believed to be a requirement.

Applicants have further modified the claims in the present application in accordance with understanding made in a telephone conversation with the Examiner, on February 26, 07. Applicants show their appreciation for the suggestions made. It is believed that all claims not withdrawn are certainly now allowable.

It is anticipated that the present amendment brings to allowance of all claims 1-23 not withdrawn. In the event that any questions remain, please contact the undersigned before issuing a FINAL rejection.

Please charge any fee necessary to enter this paper to deposit account 50-0510.

Respectfully submitted,

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